The Ballarat Naturalist

OCTOBER 2009

EXCURSION: CHARLESFORD MINE, BASALT

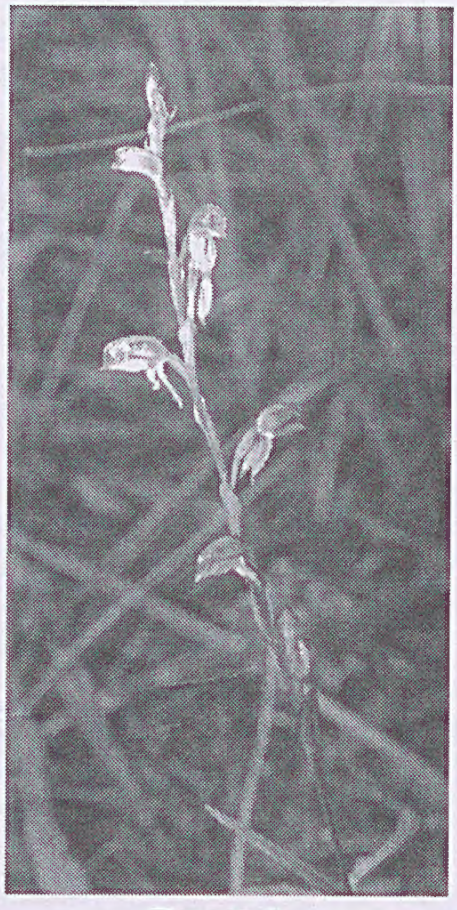
Leader: Carol Hall

Paul Norquay photographs a tall greenhood

Because Sunday was Father's Day our monthly excursion set out on Saturday morning when the weather was not too threatening. But by the time our group of 12 were approaching Creswick, fog closed in around us for a short time.

On page 6 in FNCB's publication, "Discovering Ballarat's Bushland" there is a description of the directions to our first stop at Charlesford Digging. Even though Carol was disappointed that the sun was not shining, as it had been on the previous Wednesday, the undergrowth was a colourful garden of flowers. She suggested that we have our recent publication, "Wattles of Ballarat" on hand in order to identify the few wattles in the area. Between us we noted: Rough Wattle, *Acacia aspera*, Silver Wattle, *Acacia dealbata*, Ploughshare Wattle, *Acacia gunii*, Woolly Wattle, *Acacia lanigera var. whanii*, Mitchell's Wattle, *Acacia mitchellii*, not in flower. Other flowers that were contributing to the colour were *Hardenbergia violacea*, Large-leaf Bush-pea in bud, *Pultenaea daphnoides*, Common Heath, *Epacris impressa*, Early Nancy, *Wurmbea dioica*, Tall Sundew, *Drosera auriculata*, Scented Sundew, *Drosera whittakeri*, Tall Greenhood, *Pterostylis longifolia*, green and cream Correas, *Correa reflexa*, Pink Bells in bud *Tetrathecea ciliata*, Common Hovea, *Hovea heterophylla*. Other plants were visible but not in flower such as the Twining Fringe Lily.

Above us the trees included: Red Stringybark, Red Box, Broad-leaved Peppermint and Long-leaved Box with Messmate Stringybark, Manna Gum and Candlebark down Boots Gully towards the creek. Carol pointed out to us that an important distinguishing feature between Candlebark and Manna Gum is the juvenile leaves – Manna Gum has narrow leaves and the Candlebark has round ones.



Pterostylis melogramma

Elspeth Swan alerted us to the fact that many bushland plants can be identified by parts other than the flowers, such as the leaves. For example, when we looked at the backs of three broad, green, flat leaves spread on the ground we saw the distinct colours, purple of Ajuga, white of the Bear's ears, *Cymbonotus preissianus* and pale green of Senecio, *Senecio plicatilis*.

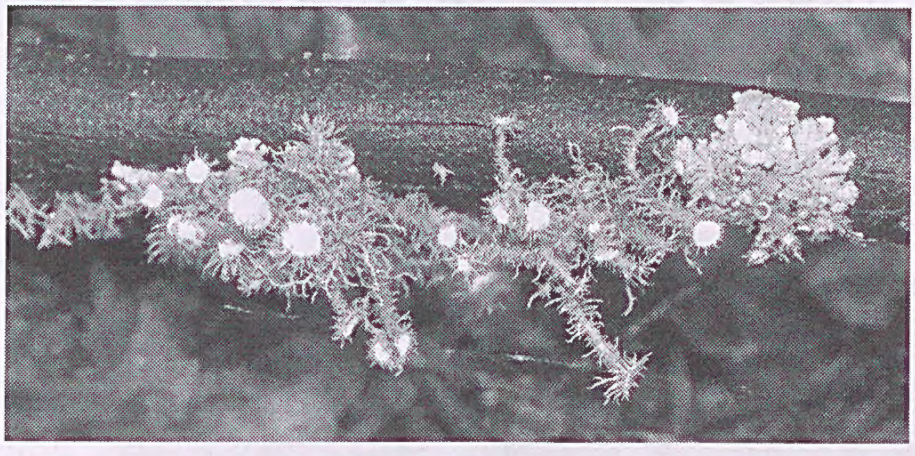
In the area a small number of fungi were seen including: Rooting Shank, *Xerula australis*, Slimy Yellow Cortinar, *Cortinareus sinapicolor*, *Laccaria, sps.*, *Lichenornphalia sps.* Yellow Belly Buttons, *Lichenomphalia chromacea,* Brown Belly Buttons, *Lichenomphalia erictorum,* White Punk, *Laetiporus portosus* which favours living eucalypts causing white heart rot. Also the rain had freshened up the mosses filling them with moisture to form a great display.

It wasn't until we were down in the gully that we heard the bird calls of the Kookaburra, Grey Shrike-thrush, White-throated Treecreeper, Martins, Wedge-tailed Eagle, Crimson Rosella, Chough, White-eared Honeyeater, Crested Pigeon.

As for other fauna there was little sign, except for the diggings left by echidnas and an anthill with large Black Bull Ants emerging from holes around the base of a mound of 40cm in diameter. Paul Norquay reminded us that the juice of the roots of Bracken Fern is a cure from the pain of a Bull Ant sting – if one is able to pull up such a fern! Also near the dam we saw a Wood Duck and heard a frog croaking.

Next we drove through both wooded areas and farming areas which Carol pointed out were on Ordovician bedrock and the basalt flows, respectively. To reach Henderson Spring we had a short walk along a track which brought us to a hole cut into rock from which mineral spring water could be collected. The spot was labeled by a plaque which described James Gordon Henderson as a member of the pioneer family of the area who had died as a Japanese prisoner in his forties.

Further along the creek Carol showed us where Ordovician rocks, which hold that gold-bearing reef, were exposed by the erosion of the creek. The water of the creek had formed an unusual feature by cutting a narrow path through a vertical wall of rock. The bedding planes of the rock were vertical because of the intense folding of the original deposits of sands, clays and mixtures of these. At this place, the jointing and bedding planes produced interesting formations; some of the finer rocks showed well-formed jointing planes to give slate-like formations while the coarse-grained sandstone produced blocks of stone with nearly rectangular solid shapes. She further discussed that newly exposed rocks go through a process of erosion. Lichens, then mosses, attach to the rocks breaking them down, especially along the weaker lines of bedding planes and joints, so that larger plants whose seeds have been brought in by wind, rain or other means, can grow in the soils formed, along with debris deposited. The plants that grow at the place become bigger and more numerous and so the process continues.



Lichen - fruiting bodies.

On the way back to the cars we noted the number of trees that had blown down apparently in a savage wind that had swept through one part of the gully.

After we left Henderson Spring we travelled a distance through similar country as before with exposed Ordovician bedrock and basalt flows often separated by a stream. We passed a plantation of cricket willows on the left, and at the next left turn into the Hepburn Newstead Road, we had the Lavender Farm on our right. Our road ran parallel to the Jim Crow Creek which was a great source of gold in the area. Then we took a right turn into Carrolls Lane and passed the Daylesford treatment works. Carol remarked that many of the trees on the roadside were similar to those in Hans Heysen's paintings which are presently showing in the Ballarat Art Gallery.

Next was a right turn on to the Midland's Highway towards Mt. Franklin - our lunch stop. We followed the picnic sign which took us off the Highway towards the mountain and into the breached crater. The crater is now a well-kept picnic ground in a grove of deciduous trees, mainly poplars. While picnicking we watched high above us, a bird fight off a raptor.

After lunch we were back on the Highway for a short distance before turning into

Sawpit Gully road, followed by Leslies Road, then Porcupine Ridge Road and lastly Woolnoughs Road to bring us to a mineral spring pump. There we were surprised to find a new well-built structure which consisted of a circular-paved area surrounded by a stone bench with the stainless steel pump in the centre. This was a pleasant picnic area, a few metres from a fast-flowing Kangaroo Creek which runs into the Loddon River and so the water eventually enters the Murray. With energetic pumping by Peter Dalman, bottles and cups were filled with the highly carbonated water. A plaque on this Woolnoughs Spring, alerted us to the fact that it contained minute parts of many salts.

This last stop was yet another interesting stop especially following the talk we had heard the night before about ground water. We raised a few queries about the source and age of the water of the spring compared to that of the nearby creek water.

Report - Fran Hanrahan *Photographs - Carol Hall*

Woolnough Spring - Peter pumps while Les catches.

Peter Dahlhaus, Senior Lecturer, University of Ballarat; Specialist in Environmental Geology and Hydrology Groundwater-Surface Water interactions.

With the use and availability of water being a concern that affects everyone, the topic for the Stella Bedggood lecture had broad community interest and Peter Dahlhaus gave an informative, interesting and wide ranging talk on water generally and specifically on groundwater in Ballarat and south west Victoria. With talk of the development of an estate for 14,000 houses in Ballarat and the development of Armstrong Creek near Torquay for a populaation the size of Ballarat right next to a RAMSAR wetland, the question of where water will come from and go to is important. Peter's talk brought out how complicated an understanding of source and use of ground water can be.

Whilst there is a lot of water on earth Peter explained that much of it is not readily available for human use. The oceans hold 96.5%. Of the fresh water, 2% is tied up as ice, mostly in the polar ice caps, only 0.0002% of water is in rivers. To give a picture of the proportion of water available for drinking an analogy was made with stubbies of beer. If 100 stubbies were affected in a similar way 8 dozen of them would be salty, 2 would be frozen and 1 ¾ underground leaving. Of the whole 100 bottles about ½ a glass would be left to drink.

With a shortage of drinkable surface water the interest in ground water has increased. Peter said that every urban water authority has a ground water licence. It was explained that the idea of underground rivers doesn't really exist. Although there are cases where rivers disappear into caves, most ground water is stored in the voids in underground material. In some materials, like pumice the voids are not joined so there is no movement of water. For groundwater to move voids need to be joined. The velocity of movement can vary from a few microns per year to 100m per day in very open fractured rock. One to two centimetres per day is fairly good. The best aquifers exist in basalt.

Two kinds of aquifers were described, confined and unconfined. Confined aquifers contain water between impermeable layers, an example being the Colac bore from which Geelong gets some of its water. This bore is 400m deep and if the top was taken off the water would spurt 15m into the air. This aquifer is recharged from the Otways.

Natural discharge from aquifers is through springs, seeps, soaks, lakes, rivers and evaporation. The age of ground water can vary enormously. Some water has been in the ground for 1½ million years whilst other water may have only been underground for a matter of days. Extracting and using water of great age should be thought of as mining. Removing and using it is like mining minerals. Once used it is gone from the ground.

The location and movement of groundwater is complex and can be difficult to understand. In some locations there can be water from more than one aquifer.

For example at Cardigan a bore at 60m draws water that is 1000 years old whilst one at 30m has water from a different aquifer with more modern water. The age of water from bores in south west Victoria varies markedly. At Vite Vite there is a bore with 25,000 year old water. In another location with bores only 1 km apart, one had 75 to 80 year old water while another had water that was 14,000 years old. Maps indicating ground water movement were shown indicating how complicated the understanding of this movement can be. Flow paths of ground water around Lake Colac were shown showing that some water may travel only a ½ km while other water travelled 7km. The movement of groundwater at lakes varies. At Lake Weering ground water has a long residence whereas at Lake Murdeduke and Colac the groundwater moves through the lakes.

Different techniques are used to determine how long water has been in the ground. The age of "old" water is determined by carbon dating. When water is in the air it picks up carbon dioxide and this stops once it enters the ground. For water that has been in the ground for a much shorter period the presence of other chemicals can indicate its age. For instance the use of CFCs stopped in 1965 so the amount of this substance can be an indicator of the last time water was above ground.

The importance of groundwater to keeping rivers and streams flowing was explained. The reason rivers continued to run was because they were fed by ground water. It was explained that if the world was Laminex, rivers would only run if it rained. In terms of ground water, streams were described as either gaining or losing and most streams in West Victoria were gaining streams.

The Moorabool River has been studied for 5 years as it is getting more salty and it is not known why. A measure of the salinity is the electrical conductivity of the water. In recent years the salinity of the upper parts has been increasing by 2ec per year whilst at the end it is rising by 24ec per year. Data on rainfall in the area is available from the 1870s onwards with drier and wetter periods and with the groundwater levels being much the same so this does not seem to be the reason for salinity increase.

The amount of data available on groundwater has increased substantially in recent times with data from monitored bores. Much of the data on local bores is available publically on the internet by going to the site http://www.ballarat.edu.au/ard/sci-eng/research/webgis/ and selecting the Bore Monitoring option.

With academic training in engineering geology and experience with the Melbourne Metropolitan Board of Works and more recently lecturing at Ballarat University and completing a PhD on salinity in the Corangamite, Peter Dahlhaus has a wealth of knowledge on groundwater and the associated geology which he imparted in a clear and engaging lecture. Members appreciated his time in preparing for and presenting this Stella Bedggood Memorial lecture.

Peter Dalman

WOMBAT FORESTCARE

We receive many newsletters from like organizations. Among the most recent was the emailed newsletter of *Wombat Forestcare.* This also gave a link to the website of this body. *Wombat Forestcare* is a community group dedicated to protecting and enhancing the natural ecosystems of the Wombat Forest and surrounding areas.

The Wombat Forest contains a diverse range of native plants and animals, including a number that are listed as rare or threatened, such as Powerful Owl and the Wombat Bush Pea. As well as these natural values, the Wombat is a significant water catchment area, giving rise to five rivers.

Photo: www.ozanimals.com

Wombat Forestcare engages in a range of activities. These have a strong focus on community involvement and education, and include undertaking flora and fauna surveys, forest regeneration, and seed collection days. They also enjoy the social aspect of a forest group, with picnics and bushwalks for people who love being in the bush. *(From the website)*

The newsletter of the group is well worth reading and is downloadable as a .pdf file. The articles and photos in the August issue include *Wombat Forest Rare Plants*; *Climate Change and the Wombat Forest*; *and Life in the Litter* by Alison Pouliot - accompanied by some of her most beautiful photos.

It is good to know that these groups exist, and to discover the work they do.

FOR SALE

Wattles of Ballarat

Member Price - $12

RRP - $14.50

Obtain your copy at the meeting.

Give copies to your friends for Christmas!

CALENDAR 2009

OCTOBER

2-4	SEANA Campout at Dunkeld hosted by Hamilton FNC
Fri 9	**Club meeting** - Jenny Sedgwick, Landcare Member *Leigh River*
Sun 11	**Excursion** - *Leigh River* - Jenny Sedgwick
Sun 11	Wildflower bus tour at Anakie http://home.vicnet.net.au/~fobr/
Tue 27	**Committee Meeting,** 7.30pm, 10A Ferguson Crt
Thur 29	**Mid-Month Excursion** - Enfield Quodrat survey

NOVEMBER

Fri 6 **Club Meeting** - *Pea Family Workshop* - John Gregurke & Club Members

. *We will be examining specimens, so bring a hand lens of magnifying glass to examine the details of pea flowers*

Sun 8 **Excursion** - *St Andrew's Block, Beaufort* - Elizabeth & Denis Thurgood, Club Members

DIARY DATE for 2010 - March 19-22 (Fortnight after long weekend)
SEANA in BALLARAT

Committee

President.....Mr Peter Dalman
Vice-President.....Mr Greg Binns
Secretary .....Mr John Gregurke
Treasurer .....Mr Les Hanrahan

Miss Helen Burgess .....
Mrs Carol Hall .....
Mr John Morrish .....
Ms Nina Netherway (editor) .....
Mrs Claire Dalman .....
Mrs Val Hocking .....
Dr Frances Hanrahan .....

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Website: www.ballarat.yourguide.com.au Click on *Community>Local Clubs> Environment*

Meetings are held at Ballarat Horticultural Centre, cnr. Gregory & Gillies Sts (VicRoads 254 F8) on the first Friday of the month at 7.30pm.

Excursions: Depart from Ballarat Horticultural Centre, cnr. Gregory & Gillies Sts (VicRoads 254 F8) at 9.30am unless otherwise specified.

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